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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

CHEN, K

ART UNIT

PAPER NUMBER

1765

DATE MAILED:

08/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/473,391

Applicant(s)

CADIEN ET AL.

Examiner

Kin-Chan Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 15-23 and 27-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 24-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 6-8, 11-14, and 24 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Avanzino et al. (US 6,140,239).

Avanzino teaches that a dielectric layer may be formed over a substrate. The dielectric layer may have trenches therein. A barrier may be formed in the trenches and on a top surface of the dielectric layer. Metal may be deposited over the barrier. The metal (such as copper) may be polished with a slurry. A slurry includes an abrasive. Dielectric layer may comprise an oxide of silicon. The barrier is electrically conductive, such as tantalum or tantalum nitride (it reads on the limitation of claims 2 and 12). As to dependent claim 4, the abrasive has a Moh's hardness between approximately 3.5 and 6. As to dependent claim 6, the slurry contains approximately 0.5% to 10% by weight of the abrasive. As to dependent claim 7, the slurry contains an oxidizer comprising H₂O₂ (see col. 4, lines 10-12, 23-28, 41-51). Avanzino (col. 4, lines 10-11) Also teaches that the abrasive may comprise iron oxide (it reads on the limitation of the abrasive in instant claims).

The instantly claimed invention differs from Avanzino by specifying the slurry may include an abrasive harder than the metal and less harder than the barrier. But because the same materials are used with the same process steps, it would inherently contain the same properties and functions as claimed, the abrasive harder than the metal (such as copper) and less harder than the barrier (such as tantalum or tantalum nitride).

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Avanzino et al. (US 6,140,239).

The discussion of Avanzino from above is repeated here.

Avanzino does not specify the pH value of slurry used in the process. However, it is conventional and obvious to dilute the slurry with weak acid or alkali to adjust pH value of slurry to between 3.5 to 7 in order to provide their art recognized advantages and produce an expected result because same is a well-known result-effective variable.

4. Claims 3, 9, 10, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avanzino et al. (US 6,140,239) as applied to claims 1, 2, 4-8, 11-14, and 24 above, and further in view of Boeck et al. (US 5,880,018).

The discussion of Avanzino from above is repeated here.

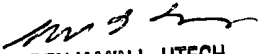
Unlike the claimed invention, Avanzino does not teach that the dielectric layer may be a conventional material, SiOF (fluorinated silicon oxide). Boeck is relied on only to teach the conventional SiOF (see col. 7, lines 36). Hence, it would have been obvious

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to one skilled in the art at the time of invention to use conventional dielectric SiOF for as taught by Boeck in order to provide their art recognized advantages and produce an expected result.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is 703-3050222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-3083836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-3055408 for regular communications and 703-3053599 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-3082934.

K-C C
August 1, 2001


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